

larvae, by preference, feed in the pods on the developing seeds. Le Pelley (*Agricultural Insects*) does record *Amphicallia solai* Druce, probably a synonym of *A. tigris* Btlr., f. *piceosignata* Bart., as feeding on *Schinus molle*

(Anacardiaceae), but many of his records are suspect and this is almost certainly wrong: I have bred it on *Crotalaria*.

After all *Bombyx crotalariae* F. is a synonym of *Argina syringa*.

MOMBASA,  
KENYA,  
EAST AFRICA,  
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### 30. BREEDING SEASON AND GESTATION PERIOD OF THE SCORPION, *HETEROMETRUS FULVIPES*

Certain amount of controversy exists with reference to the breeding season and gestation period of *Heterometrus fulvipes*. As early as 1891, Laurie estimated the period of gestation of *H. fulvipes* to be over 6 months. This estimate was based on the assumption that there is a definite breeding season in this species and that the earliest stages of development were found in October and the latest in May. However, Mathew (1956) was not able to find out the gestation period definitely and he suggested the possibility of the gestation period being much shorter than that suggested by Laurie. Occurrence of a definite breeding season was also contradicted by him.

During the course of a detailed study of the physiology of reproduction and development of the scorpion *H. fulvipes*, it has been possible to examine monthly samples of over 100 specimens over a period of 3 years and a clear cut picture about the breeding season and the gestation period was obtained. The developmental stages from the earliest stages of gastrula to the preparturition stages were divided into 8 groups based on length and external characters for characterizing the stage of development. Monthly samples of scorpions were dissected and the stages of development

were noted. All the embryos of a given animal were always found to be in the same stage of development.

Table I gives the month and the percentage of animals carrying the embryos corresponding to the indicated stage of development. It could be noticed that majority of the gravid females collected in a month contained embryos belonging to only one stage and a lesser percentage of them contained embryos belonging to a stage preceding or succeeding that stage. No batch of gravid females contained all the developmental stages. This clearly indicates the occurrence of a definite breeding season. Based on the data presented in Table I it could also be inferred that the gestation period extends over a period of about 11 months with the earliest stages appearing in the months July and August and the latest stages appearing in May and June.

While studying the courtship and mating behaviour of the scorpion *H. fulvipes* (Reddy 1975), readiness to court and mate and successful mating were noticed mostly during the months, July and August. It could therefore be taken to substantiate the data obtained here and the breeding season can be conveniently said to correspond to these months. Par-

TABLE I

DISTRIBUTION OF DEVELOPMENTAL STAGES IN THE MONTHLY SAMPLES OF GRAVID FEMALES OF *H. fulvipes*.

Stages	Months											
	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
I	68	29										
II	32	47	48	20								
III		24	52	40								
IV				40	45	21						
V					55	79	50	27				
VI							50	55	62	13		
VII								18	38	56	10	
VIII										31	90	100

The data represents percentage of gravid females carrying the embryos of a given stage.

turition was always recorded only during the months of May and June and never before or after. This lends further support to the occurrence of a breeding season. *H. fulvipes* thus resembles *H. swammerdami* which has a definite breeding season (Habibulla 1962) and differs from *H. scaber* which has no definite breeding season (Mathew 1956).

It is concluded that the scorpion *H. fulvipes* has a definite breeding season confined to the

months July and August and a gestation period of about 11 months.

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REFERENCES

HABIBULLA, M. (1962): Studies on the neuro-secretory system of an arachnid *Heterometrus swammerdami*. Ph.D. thesis, Sri Venkateshwara University, Tirupati.  
LAURIE, M. (1891): Some points on the development of *Scorpio fulvipes*. *Quart. Journ. Mic. Sci.* 32:105-141.

MATHEW, A. P. (1956): Embryology of *Heterometrus scaber*. *Univ. Travancore Zool. Mem.*, 1.  
REDDY, T. GOPALAKRISHNA (1975): Courtship and mating in the scorpion *Heterometrus fulvipes*. *Bulletin of the ethological Society of India*, 1 (2): 36-42.